

BEETLE ECOLOGY (1)

by John R. Dobb, F.R.E.S.
Wollaton, Nottingham

A new and extremely interesting method of approach to the study of Beetles is gradually developing through the application of ecological principles. This has arisen in the following way. The expanding knowledge of the Coleoptera has resulted in an ever increasing specialisation of smaller and smaller sections of the Order, both from the aspect of determining the specimens collected from particular geographical areas and of recording the biological data, the former being the special concern of the systematist and the latter that of the biologist. The specialist, whether systematists or biologist, reached the stage however, when they realised that if further progress was to be made in getting to know in greater detail the true relationships of the different kinds of living things, and more exactly how they live, still more initial data must be supplied to them by those concerned with the collection and observation of the organisms in the field. The field naturalist began to widen his view to include not only the animal or plant with which he was primarily concerned, but also the environmental factors which he found to be of great significance in enabling him to track down those organisms for which he was searching, or directly affected them in one way or another.

Thus arose the Science of Ecology which can be defined as:-

the study of an organism, its relation to, and how it is affected by, all other natural organisms and physical forces within its orbit.

I believe it correct to say that ecological studies were first accredited to the botanists and, owing to this, there has been a considerable amount of misapprehension in the general understanding of the meaning of the science of ecology which has quite often been written about and spoken of as if it was only applicable to the field studies of the plants. In fact, the ecological principles attach just as much to the animal as to the plant kingdom.

Perhaps the most interesting and significant aspect of ecology is its scientific method of synthesizing the various aspects of the knowledge attaching to the living organism which forms the main line of the particular research. Thus it will be understood that to accomplish successfully any piece of ecological research an exceptionally wide experience covering various aspects of nature is called for.

What are these environmental factors which, when taken into consideration prove of real value to the coleopterist? They are broadly divisible into the two categories:-

- (a) The biological features of the habitat.
- (b) The physical features of the habitat.

The biological features of the habitat include such data as the kind of plant or animal host, the exposure, or otherwise, to attack

by such natural enemies as predators, parasites and micro-fungi, and the type of plant association such as coniferous woods, heather moors, marsh meadows, salt marshes, etc.

The physical features of the habitat include the nature of the soil, whether acid, neutral or alkaline, the geographical formation of the particular area under investigation, and in the case of aquatic species, the purity and consistency of the water, whether fresh, salt or brackish; also the amount of exposure to climatic conditions, the altitude, temperature and humidity ranges.

The above are but a few examples of the kind of information to be noted when the desired beetle is successfully traced in its natural habitat, and all this data becomes highly significant not only to enable a true conception of the actual place occupied in nature by the particular beetle in question, but in addition, armed with sufficient ecological data the systematist can be aided in his determination of the species.

At first the latter contention may appear startling, though due consideration will show it to be apposite.

Up to very recent times the naming of genera and species has been dependent upon an analysis and comparison of certain of the structural characters of the group within which the particular specimen was found to belong. The higher group characters were also based upon such taxonomic data. This explains for the commencing student how very specialised is the knowledge of the anatomy of the coleoptera required for differentiating the species, of which there are such a large number, standing in close relationship from the evolutionary standpoint.

It will be seen that there are now two kinds of data which can be used towards the determination of the species (1) the taxonomic data based upon structure and (2) the bionomic, based upon the particular mode of life. From each of these bases a classification of the Order can be built up, the one being termed a Phylogenetic Classification because it is an attempt to arrange the component species in accordance with evolutionary development, and the other being termed a Bionomic Classification because it is an attempt to arrange the component species according to their various natural associations in life and their specialised biological requirements.

(to be continued)

FIFTH SUPPLEMENT

Announcement has been received from Mr. John D. Sherman, Jr., that the Fifth Supplement to the Leng Catalogue of Coleoptera of America, North of Mexico, by Richard E. and Ruth M. Blackwelder will be issued in November, 1948. This supplement will contain, according to the announcement, additions, corrections and bibliography for the years 1939-1947 inclusive. The price, postpaid, incredible as it may seem, is announced as \$ 7.50, nearly half what the entire original catalogue and the first four supplements cost!

[Ed.]